Comments on the Proposal from The Pennsylvania State University:

**An Integrated Program to Accelerate Breeding of Resilient, More Productive Beans**

**for Smallholder Farmers** [No Date]

As a social scientist (agricultural economist), I’m not familiar with all of the biological sciences engaged here (I had to look up a term or two). That given, here are some comments based on a review of the Executive Summary and the Technical Application, as well as the first two annexes (through page 29).

**Strengths**

To my understanding, the Application is logically designed to achieve its goal, improve bean production for smallholder farmers in stressful environments, in five years. It is thorough in its approach and processes. The Application is well documented with footnotes.

The Application is forward leaning, anticipating the impacts of climate change, some of which are already seen. The Application reaches across countries, continents and institutions. It links several sciences – genomics, phenology and plant breeding – with social sciences to find bean varieties that tolerate abiotic stresses, heat and drought. Biotic improvements in yields, though be a welcome, are a secondary objective.

The Application takes advantage of advances in genomics and phenology, as well as improvements in computer programming, to identify traits (characterize) and genetic markers to facilitate breeding progress. It proposes to investigate the promising cross of the common bean (*Phaseolus vulgaris*) with the tepary bean (*Phaseolus acutifolius*). This breeding strategy will be integrated with the social and economic components of the project.

Having attended the recent Gender Global Learning and Evidence Exchange (GLEE), I was pleased to see the attention paid to acceptance by women, the household members most likely to grow improved varieties, in terms of labor time, taste and income *versus* awareness of the improved varieties, uptake and home consumption. The Application has linked up with an acclaimed communications department to help manage messaging.

The proposed management plan is sound, necessitated by many participants and disciplines working in different locations and time zones. The project structure is looks good, with a project director, project manager and executive committee. An advisory committee provides big picture guidance annually. The management plan prescribes monthly conference calls. The Application sets expectations of timely research reports, rules of authorship and open access to results that the USG is embracing.

In short, the Application is effectively written in a way that leads the reader to think that finding stress-tolerant, more productive beans is one of the world’s most pressing problems for which – if this Application is approved – solutions are within reach.

**Weaknesses**

The value of the advisory committee is seriously compromised if it provides advice only once per year.

Given the research and management complexities of this proposed undertaking, it’s surprising that the project director will spend only 5 percent of his time on this integrated Program. At 25 percent, the project manager is not much better. Understandably, research of this kind proceeds at its own pace (such as breeding) that allows the project director and manager to carry out their other work at the same time. However, the clear impression is that this project is a part-time effort and a minor effort for project managers, at that. Except for one researcher spending 75 percent of his time and another at 30 percent, the time allocation for this project is inadequate.

**Significant Weaknesses**

The inadequate allocation of time (above) could be rated as a significant weakness. In standard TEC language, this is “a flaw in the proposal that appreciably increases the risk of unsuccessful [grant] performance.”

**Deficiencies**

None noted.

**Relevance to Central American and the Caribbean**

You asked how the LAC region would benefit from this research. Taking into account “robust findings and key uncertainties,” the IPCC *Climate Change 2007: Synthesis Report* (<http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf> ) suggests that Central America and the Caribbean will be drier by mid-century. Specifically (page 52), “By mid-century, climate change is expected to reduce water resources in many small islands, e.g. in the Caribbean and Pacific, to the point where they become insufficient to meet demand during low-rainfall periods.”

Thus, this accelerated research is relevant for abiotic drought stresses alone. I did not find similarly “emphatic” statements on higher temperatures in Central America and the Caribbean but some broad-scale maps point to higher temperatures.

The well-respected Zamorano University in Honduras will be one of the partner organizations under this Application. Its principal investigator, Juan Carlos Rosas, will work on bean breeding in collaboration with the relevant national institutes of Honduras, Nicaragua, Guatemala and Haiti (page 23) to reach 120,000 farmers with improved varieties and other technologies.

Given the prominence of beans in the traditional diets and the contribution of beans to food security and nutrition, bringing Central America and the Caribbean into this research effort is a decided plus.

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*June 6, 2013*